

CLAIMS

1. A wafer pre-alignment apparatus comprising:

a wafer rotating member capable of rotating a disk-shaped wafer held on a table having a vertical rotating axis;

a rotation detecting member for detecting a rotating position of the wafer rotating member and converting the rotating position detected into an electric signal;

a light emitting member for emitting light toward the periphery of the wafer held by the wafer rotating member;

a CCD linear sensor including a large number of pixels linearly arranged in a predetermined order, for reading out stored charges successively from the first pixel according to a transfer pulse signal and successively outputting stored charges of all the pixels as electric signals;

a signal processing member for repeatedly detecting the edge positions of the wafer at a plurality of optional points over the outer periphery of the wafer when it receives a signal from the CCD linear sensor and a signal from the rotation detecting member and storing these edge positions thus detected in a memory, and acquiring at least one of an orientation-flat position, notch position and center position of the wafer on the basis of the edge

positions detected;

an up-down counter for counting signals received from the rotation detecting member;

a measured angle setting register for storing angular value information which is obtained by dividing the number of counts during a single revolution by the rotation detecting member by the number of measurement points during the single rotation; and

a comparator for comparing the angular value information set in the measured angle setting register and the counted value of the up-down counter.

2. In a wafer pre-alignment apparatus comprising:

a wafer rotating member capable of rotating a disk-shaped wafer held on a table having a vertical rotating axis;

a rotation detecting member for detecting a rotating position of the wafer rotating member and converting the rotating position detected into an electric signal;

a light emitting member for emitting light toward the periphery of the wafer held by the wafer rotating member;

a CCD linear sensor including a large number of pixels linearly arranged in a predetermined order, for reading out stored charges successively from the first pixel

according to a transfer pulse signal and successively outputting stored charges of all the pixels as electric signals; and

a signal processing member for repeatedly detecting the edge positions of the wafer at a plurality of optional points over the outer periphery of the wafer when it receives a signal from the CCD linear sensor and a signal from the rotation detecting member and storing these edge positions thus detected, and acquiring at least one of an orientation-flat position, notch position and center position of the wafer on the basis of the edge positions detected,

a method for wafer pre-alignment comprising the steps of:

setting, in a measured angle setting register, angular value information which is obtained by dividing the number of counts during a single revolution by the rotation detecting member by the number of measurement points during the single rotation;

inputting a signal supplied from the rotation detecting member in an up-down counter up-counts during normal rotation of the wafer rotating member and down-counts during reverse rotation of the wafer rotating member;

if the comparator determines that rotation position

information obtained as a result of an increase/decrease of the counted value in the up-down counter during the rotation of the wafer rotating member is equal to the set value in the measured angle setting register, zero-clearing the counted value simultaneously with outputting of a measurement command,

repeatedly detecting the edge position of the wafer at the measurement points over the outer periphery of the wafer;

storing detected values thus obtained in a memory;
and

acquiring at least one of an orientation flat position, notch position and center position of the wafer.